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called Ek Balam, or the city of the black tiger. He was obliged to get away very soon, but now that the place is known it can be revisited. On an island about eight leagues north of Campeche he found a Maya burial ground which has never been investigated by a man of science. He lived here about fifteen days, the Indians gradually abandoning the camp for fear of the dead men's retaliation, owing to the death of one of their number. He then returned to Ek Balam, where he remained eighteen days. He is now busy on his report, which will be ready in a few months.

Greenland.—The information derived from the Danish newspapers in regard to Lieutenant Ryder's expedition to Greenland is enlarged and corrected on the authority of that officer. The party should have left Copenhagen on May 9, and did not expect to return before the autumn of 1887. The commission, besides Messrs. Ryder and Bloch, will comprise the geologist Ussing. The object of the exploration to be made is the little-known coast between Melville Bay and Upernivik, which has never been scientifically surveyed. It is hoped that suitable charts can be prepared when the commission has finished its researches, which will include soundings as well as geographical and geological surveys.

A newly discovered lake on the Spanish frontier.—Schrader has for some years been engaged upon surveys among the higher Pyrenees, and recently presented the third leaf of his proposed six-leaved chart of the central Pyrenees to the Paris geographical society. On this occasion he called attention to several points of interest. This third leaf represents the Aran valley on the north slope, but which being Spanish territory has not been included in the map of the French general staff. Part of it has been represented as draining into the Mediterranean, while it really is tributary to the Garonne. In the second place, Schrader's triangulations, made with difficulty amid the fogs and wind-storms of the higher peaks, showed a gap unfilled between two chains of peaks which, approached from opposite sides, he had supposed to form a single range. The explorations of Dr. Jaubernat of the Alpine club, of Toulouse, a zealous botanist and photographer, showed that this gap was filled by a lake, the largest on the whole northern slope of the Pyrenees. No one else had ever seen it. So it appears that it is only since the summer of 1883, when Jaubernat took his photographs, that any one has known of the existence of the largest lake on the Spanish frontier. M. Schrader adds that on the south and south-east of the Aran valley, several ranges are to be found, nearly ten thousand feet in height, which as yet have no

place on any geographical map. It would seem that explorers may still find congenial work, even in Europe.

LONDON LETTER.

It is probably known to many readers of *Science* that a trial has lately taken place in London, the result of which, if not reversed by appeal, will seriously affect the future of electric lighting in this country, so far as incandescence lamps are concerned. Nobody but Messrs. Edison and Swan may now use the carbonaceous 'filament.' The use of such filaments is decided to be an infringement of the patent granted to Mr. T. A. Edison (Nov. 10, 1879; No. 4576), for the use of a 'light-giving body of carbon wire or sheets.' It has just been pointed out by Mr. Mattieu Williams, who himself assisted in the experiments more than forty years ago, that the real inventor of the process for obtaining light by the incandescence of a strip or wire of carbon was a young American, Mr. Starr, whose patent for it (taken out by Mr. King) was enrolled on May 4, 1846. At the end of a barometer-tube a bulb was blown, into which a platinum wire was fused, and to one end of this a stick of gas-retort carbon was fastened, the other wire being carried through the mercury,—the whole tube being 33 inches long. Mr. Starr tried platinum, and platino-iridium alloys, in wires and sheets, carbonized threads, cane, etc., before he hit upon gas-retort carbon. The lamp was repeatedly exhibited in action, at the town hall, and the Midland institute in Birmingham, by Mr. Williams. The carbon stick was 0.1 inch in diameter and 0.5 inch long; and the platinum wire had the same sectional area as the rod. The light was eminently and brilliantly successful; but funds were exhausted, and none concerned in it were adepts in getting up companies. Moreover, Mr. Starr was engaged in improving the magneto-electric machine then in use for electroplating, etc., by Messrs. Elkington of Birmingham; hence the matter was not followed up.

A very ingenious primary battery has just been brought into public notice by Messrs. Woodhouse & Rawson, the invention of M. René Upward. An outer cell, sealed at the top, holds fragments of carbon, slightly moistened with water; an inner porous cell contains zinc immersed in water. Chlorine gas is passed through the outer cells, each of which is of course provided with an inlet and outlet pipe, and a vacuum of about 0.5 inch water is maintained in the whole series of outer cells. The electromotive force per cell is 2.4 volts. The battery is entirely free from 'local action' and 'polarization,' and has been specially designed for small electric-light installations. For

this purpose, it is well to connect it with some form (preferably that known as E. P. S.) of storage battery or accumulator. The chlorine is disengaged very simply from hydrochloric acid and manganese, and a necessary part of the apparatus is a small gas-holder, conveniently constructed of drain-pipes covered with pitch. All the gas apparatus is worked on the displacement principle, chlorine being nearly $2\frac{1}{2}$ times as heavy as air. The apparatus necessary to establish a small installation of 15 to 18 ten-candle power lamps costs about \$250. The commonest sheet zinc may be used, and the corrosive action is very slow, and remarkably regular.

At a recent conference at the Colonial exhibition, a paper was read by Mr. Sievwright on Colonial telegraphs, in which warm tributes were paid to the early labors, 1^o, of Dr. (now Sir Wm.) O'Shaughnessy in India, who in 1839 and following years carried out experiments on the transmission of telegraphic signals by 'galvanism,' and 2^o, of Mr. T. R. Crampton, the engineer who in 1851 laid the first submarine cable across the English Channel, and whose pluck and energy found, in addition, nearly the whole of the money necessary for the undertaking. Mr. Crampton was present, and made an interesting speech in the discussion which followed, in the course of which, also, the need of a submarine cable from the American to the Australian continent was alluded to.

The newly organized gunpowder factory at Chilworth was recently inspected by a party of scientific men, where, under Herr Hiedemann's direction, the new brown or 'cocoa' powder is being produced. Wood charcoal is replaced by another form, and the proportions of sulphur and nitre have been so changed that but little smoke is produced. Except in a gun-chamber, the firing of the powder is very slow, and a new departure in the history of artillery has taken place.

Dr. C. R. Drysdale, senior physician of the Metropolitan free hospital, is one of the most recent distinguished converts to Pasteurism. Having visited Paris, and investigated 740 cases treated in the Rue Vauquelin, in which there was no doubt of the madness of the dog, he gives the death-rate as 0.75 per cent, while under other treatments, the death-rate is 16 per cent. Hence he considers that the value of M. Pasteur's treatment is 25 times as great as that of all the other treatments.

The use of petroleum as fuel was the subject of a paper by Colonel Stewart at the United service institution recently, and a warm discussion followed. The Russians have now applied liquid fuel in various ways to 200 steamers, 700 or 800

locomotives, and probably 1,000 stationary engines. In England the use of liquid fuel is still only in an experimental stage, whereas in Russia the labors of Urquhart, Lentz, and other sound practical engineers, have made it as familiar as constant practice can make anything. A suggestion was made that English ship-owners should send one of their staff to Baku to examine the various systems in use. Two pioneer steamers are now being fitted out on this principle in West Hartlepool, one of which, the *Glückauf*, is to be engaged in carrying oil from the United States. She is of steel, to carry 3,000 tons dead weight, fitted with triple-expansion engines, with cylinders of 22, 35, and 58 inches diameter. Two single-ended steel boilers, with two furnaces in each, are expected to develop 1,000 horse-power.

W.

London, July 13.

NOTES AND NEWS.

THE local committee of the American association announces that the arrangements for a successful meeting are fairly completed. A misstatement was made in the first circular regarding telegraph dispatches. The Western union telegraph company has consented to accept for free transmission over its lines only the *official* telegrams of the association, and will charge one-half of the regular rates to members who have their messages stamped by the local secretary. The American express company, the United States express company, and the National express company will ship packages over their own lines free of charge to Buffalo providing, such packages, 1^o, contain specimens, etc., to be used during the meeting; 2^o, do not exceed twenty-five pounds in weight; 3^o, are shipped at owner's risk and are addressed to the American association, care of the local secretary at the High school in Buffalo. The following programme has been arranged by the local committee: Thursday, afternoon, excursion down the Niagara River to Grand Island; evening, the Botanical club of Buffalo will receive the Botanical club of the association, at the residence of Hon. David F. Day; the Entomological club of Buffalo will receive the Entomological club of the association at the rooms of the Society of natural sciences. Friday, afternoon, Mrs. Bronson C. Rumsey will receive the association at a lawn party at her residence on Delaware Avenue from 4 to 6 o'clock; evening, illustrated lecture by Prof. C. A. Ashburner, on 'the Geology of oil and gas.' Two excursions will be given to the members of the association on Saturday, one to Niagara Falls, the other to Chautauqua Lake. Monday, afternoon, excursion of the Botanical